BIOMECHANICS AT THE NSRDEC | WarSTAR

OVERVIEW:

The Center for Military Biomechanics Research is collaboratively funded and jointly staffed by the NSRDEC and the U.S. Army Research Institute of Environmental Medicine (USARIEM) to conduct basic and applied research in Biomechanics, with the goal of developing a fundamental understanding of the interaction between individual Warfighters and their equipment. The Center's physical facility is unique in DoD. It consists of a 7,500 square foot dedicated laboratory outfitted with state-of-the-art equipment for 3-dimensional analysis of movement, measurement of external forces on the body, monitoring of muscle activity, assessment of oxygen consumption, and real-time mapping of pressure patterns.

FOCUS:

The Center studies forces in and on the human body and the effects produced by these forces, such as inefficient work performance. Research is focused on determining ways to avoid injury and enhance performance by informing the design of Warfighter clothing and equipment, specifying the physical requirements of military occupational tasks, and developing methods to optimize military physical training programs.

CURRENT RESEARCH THRUSTS:

- Dynamic human modeling and simulation tools to optimize the design of body armor
- Biomechanical effects of prototype extremity body armor
- Biomechanical markers to track and predict the onset of physiologic fatigue
- Lightweight low-powered exoskeletons to augment Warfighter physical capacities
- Full-powered, fully actuated exoskeleton prototype to augment logistical capabilities
- Biomechanical capability of active duty below-knee amputees to meet military physical performance requirements
- Inertial effects of heavy backpack loads on Warfighter performance

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